

CHAPTER 6

ARCHITECTURAL

6-1. GENERAL

a. Design Excellence. Achievement of excellence in architectural design will be a prime goal for all military construction projects. Reaching this goal requires a commitment from all levels within an organization. Designers will assure architectural compatibility with the local environment, economy of construction, energy conservation, functional requirements, interior and exterior detailing, life cycle cost, and siting. Special emphasis must be placed on the quality of the architectural design since it affects the attractiveness, economics, efficiency, livability, longevity, and usefulness of most facilities. It should be recognized that quality design does not imply added expense but often results in savings. However, regardless of size, type, or location of the facility, it is the responsibility of the designer to provide a quality design that is not only functionally appropriate, but is also aesthetically pleasing and incorporates principles of good architectural design.

b. Architectural Theme. Good master planning and principles of design dictate the establishment of a suitable architectural character for an Army installation. The architectural theme is normally established by the installation design guide. In the absence of an installation design guide, the designer will establish an overall theme for architectural style (either existing or new), colors, and materials that is in keeping with local culture and customs and is appropriate for the geographic area or climate.

6-2. APPLICABILITY. This chapter outlines the requirements, responsibilities, and objectives for preparing and presenting architectural designs. This chapter supplements the requirements of chapter 1, General Instructions, and chapter 2, Presentation of Data.

6-3. REFERENCE DOCUMENTS. The documents listed below are directly referenced in this chapter and should be used. Designers are required to become familiar with the requirements in these documents and ensure compliance where applicable.

- a. CEGS, Corps of Engineers Military Guide Specifications
- b. ER 1110-345-700, Design Analyses
- c. FED-STD-595B, Colors
- d. MIL-STD-12D, Abbreviations for Use on Drawings, Specifications, Standards, and in Technical Documents
- e. MIL-HDBK-1008B, Fire Protection for Facilities Engineering, Design, and Construction
- f. MIL-STD-1472D, Human Engineering Design Criteria for Military Systems, Equipment, and Facilities

- g. NFPA 80, Standard for Fire Doors and Windows
- h. NFPA 80A, Recommended Practice for Protection of Buildings from Exterior Fire Exposures
- i. NFPA 101, Code for Safety to Life from Fire in Buildings and Structures
- j. TM 5-805-6, Caulking and Sealing
- k. TM 5-803-2, Planning in the Noise Environment
- l. UFAS, Uniform Federal Accessibility Standards
- m. UBC, Uniform Building Code
- n. Americans with Disabilities Act, Accessibility Guidelines (ADAAG), Appendix B

6-4. ARCHITECTURAL/DESIGN CONSIDERATIONS

a. Special Considerations. The contract document and design criteria provide data pertinent to the project. There are areas which require special consideration to ensure design quality and compliance with applicable codes and standards. Energy conservation and life cycle cost design features will be reflected in the Energy Conservation and Life Cycle Cost Design Analysis specified in chapter 1. Essential architectural considerations or emphasis are as follows:

(1) **Functional Design.** All facility planning will employ economical, functional architectural and engineering design which is closely tailored to the actual requirement of the project, with particular attention given to the selection of exterior and interior finishes and to the extent and type of equipment and services to be provided. Building systems and assemblies, or major components which meet project criteria and regional design conditions, will be evaluated on the basis of construct- ibility, biddability, economy, availability of materials, and maintenance. When possible, floor, roof, and wall assemblies will be designed with stock components subject to maximum competition as specified by Corps of Engineers Guide Specifications. Facilities will be provided at the lowest reasonable cost while achieving the optimum life cycle cost.

(2) **Passive Solar Design.** Passive solar design is a definite and continuing means of achieving energy savings over the life of individual facilities. Therefore, an explicit effort will be made to evaluate the passive solar design conditions for building sites and facilities to effectively orient the facility and to provide coordinated fenestration which is energy efficient. Normal orientation within CONUS is south to southeast which achieves quick warm-up in winter and maximum ventilation during cooler periods.

(3) **Active Solar Design.** Active solar design will be as directed in the project criteria and A-E contract. Active solar planning must take into consideration the climate and geographic location. In some parts of the continental U.S., i.e., the Southwest, Southeast, and West, active solar projects have proven very successful. In many applications, ground mounting of collectors has proven more successful and is recommended.

(4) Daylighting and Ventilation. Daylighting and ventilation are essential for most construction within CONUS to meet minimum building code requirements for habitable spaces, fire access, and energy conservation. Daylighting will be an integral element for architectural design and will be provided for domiciliary, office/administrative spaces, and waiting or public areas as appropriate. It is also recommended for restrooms. Operable windows will be used unless the Using Agency specifically requests fixed-glass, non-operable lights.

(5) Skylights. Skylights will be double glazed for all air-conditioned facilities. Special attention will be given to detailing the skylights to prevent leaks.

(6) Solar Screening or Shading. Solar screening or shading will be used to reduce cooling loads. The basis for the solar screening or shading will be shown in the architectural and mechanical design analyses.

(7) Technical Codes and Standards. Compliance with minimum life safety, building codes and technical manuals cited in this manual are mandatory. If deviations from criteria or codes are necessary, requests will be put in writing and fully justified with compensating provisions to assure an equivalent level of safety. State and local building codes and building regulatory agencies do not normally have jurisdiction on military installations. State and local building codes and regulatory agencies have jurisdiction over Government-owned or -leased facilities that are not on military reservations. Any exceptions to this general policy will be stated in the Project Development Brochure (PDB).

(8) Construction Classification. The designer is technically responsible for determining that occupancy classifications, minimum fire resistances, fire protection systems, and means of egress requirements conform to the codes and standards cited above. Construction classifications and functional layout issued as project criteria in the PDB documents are essentially programming data; analysis and confirmation by the designer is required. This is particularly important where buildings have multiple occupancy classifications and/or are hazardous spaces. Height and area limitations relating to fire resistive classifications will be according to Military Handbook 1008B or the Uniform Building Code, whichever is the most stringent.

(9) Barrier Free Design. Except for specifically exempt facilities, all facilities will be designed to meet the Uniform Federal Accessibility Standards (UFAS), but also must meet the requirements of appendix B of the ADAAG Handbook wherever the ADAAG provides equal or greater accessibility than the requirement of the UFAS.

(10) Site Adaption. When site adapting standard design drawings (or using earlier designs from other locations), the design changes will generally be limited to the selection of alternate exterior or interior materials, when such changes are economically and regionally justified, and to update changes necessary to conform to current criteria.

(11) Alternate Designs and Recommendations. Alternate designs will not be developed unless required by the scope of work. Designers, however, are encouraged to make recommendations to improve the functional and/or technical criteria. Such suggestions, with sketches and documentation, should be submitted in a timely manner to permit evaluation and approval, preferably before the first design review.

6-5. ARCHITECTURAL DRAWINGS

- a. Drawings will be prepared in accordance with chapter 2, Presentation of Data.
- b. The architectural drawings will be organized in the following order:
 - (1) Composite plan, if deemed necessary.
 - (2) Floor Plans
 - (3) Fire Protection Code Compliance Plan
 - (4) Reflected Ceiling Plan
 - (5) Roof Plans
 - (6) Enlarged Plans
 - (7) Elevations
 - (8) Building Sections
 - (9) Wall Sections
 - (10) Details and Schedules

6-6. CONCEPT DESIGN SUBMITTAL REQUIREMENTS. The A-E will prepare the concept design in accordance with the functional criteria and the scope of work. This submittal will include as a minimum the following:

a. Design Analyses. The A-E will prepare a design analysis in accordance with ER 1110-345-700. The design analyses will state the purpose, function, and capacities in sufficient detail to fully present the design solutions, materials, features, and the visual appearance of the project. The general description will describe the architecture of the region and that of existing facilities and will include a statement of the NFPA Building Occupancy Classification, the UBC Type of Construction, and the UBC Occupancy Group. It will also include a statement of any requirements for signage plans or graphics, and will provide a brief statement on the interior and exterior finish materials used in the project. The designer/ architect will submit complete calculations for gross building areas, the "U" values for each exterior wall assembly and roof assembly, and the counts for toilet fixtures, urinals, and lavatories per appropriate codes and standards.

b. Outline Specifications. All guide specifications used for the project will be listed along with a brief description of the main features of the specifications which apply to the project.

c. Architectural Drawings. Drawings will be provided in sufficient detail so the Using Agency can visualize precisely how the designer has interpreted the functional and operational requirements. Drawings will include, but not be limited to, the following:

- (1) Cover Sheet. A project cover sheet will be provided as a Mylar reproducible. Authentication will be completed in accordance with chapter 2, paragraph 2-4e(4) of this manual.
- (2) Perspective. Provide single-line perspectives when required by the scope of work. This is normally shown on the cover sheet.
- (3) Architectural Floor Plans.

(a) Composite Plans. If the overall floor plan cannot be drawn on one sheet at a 1:100 (1/8-inch per foot) scale, the designer will provide a smaller scale, 1:200 (1/16-inch per foot), floor plan showing exterior walls, interior partitions, circulation elements, and cross referencing for enlarged partial floor plans. A key plan will be used on each sheet which shows the relationship of the partial plan with the rest of the building.

(b) The floor plan or partial floor plans will be drawn at 1:50 (1/4-inch per foot) for small buildings or 1:100 (1/8-inch per foot) scale with major elements enlarged on another drawing. The plan should include critical and overall dimensions and functional arrangements of all areas, including corridors, exits, stairs, support spaces, etc. All spaces will properly relate to exterior access roads, parking lots, service areas, etc. Any additional information may be added which will assist in the cost concurrence estimate required at this design stage.

1 The column grid lines will show the relationship of architectural and structural systems. Columns may be omitted on criteria drawings. However, columns and grids lines will be shown on all design submittals and be consistent with the functional requirements.

2 The location and rating of fire walls and partitions will be shown on the architectural floor plan. Openings in and penetrations through firewalls and partitions will be designed in accordance with National Fire Protection Association standards.

3 Gross Floor Areas. Floor areas will be indicated in tabular form on the architectural floor plan sheet. The breakdown will be composed of the totals for spaces computed at full areas, for spaces computed at one-half area, and for their combined total. The areas will be computed in accordance with the AEI, chapter 5. The floor plan itself will be devoid of floor area indications.

4 Rooms. On the architectural floor plan where an area is divided into rooms, individual room numbers and names will be shown for each room. These names and numbers will be used in preparing the room finish schedule.

(c) Multi-story Buildings. The designer will show a floor plan for each floor and include the table of Gross Floor Calculations on the sheet with the first floor plan.

(d) Demolition Floor Plans. For renovation projects, demolition floor plans will show clearly the work and nonwork requirements required on renovation and modification projects. Where work is extensive, color overlay sheets should be used to show existing-to-remain, demolition, and new work.

(e) Fire Protection Code Compliance Plan(s). The code compliance information will be presented on the drawings in the concept design phase. These drawings will be updated to reflect design evolution changes and submitted with subsequent design review packages, but will not be part of the final construction drawings. The presentation will be in a format that will facilitate code and regulation evaluation against the design submitted. The analysis will be based on MIL-HDBK-1008B and those portions of the Uniform Building Code and NFPA 101 Life Safety Code as referenced in MIL-HDBK-1008B. Questions involving any conflicts between these codes that cannot be resolved by following the most

stringent requirement will be presented, with recommendations for resolution, to the Government. The plan(s) will contain, as a minimum, the following information:

- 1 Occupancy classification(s)
- 2 Construction type classification(s)
- 3 Allowable floor area(s)
- 4 Allowable floor area(s) and area separation requirements
- 5 Allowable building height and number of stories
- 6 Allowable building height and area increases
- 7 Building occupancy separation(s)
- 8 General fire suppression requirements due to occupancy hazards and/or building area increases
- 9 General fire detection requirements of the occupancy classification
- 10 Site separation requirements identifying clearances to property lines and other buildings
- 11 Allowable percentage of exterior openings
- 12 Fire ratings of exterior openings if required
- 13 Building occupancy loads per floor or building area
- 14 Means of egress requirements to include required width and capacity of passage ways, corridors, stairs, ramps and doors; travel distances, common path of travel exit discharge; horizontal exits and areas of refuge; fire resistive requirements for exit and exit access enclosures.
- 15 Fire resistance of materials identifying fire test numbers of assemblies used.

(f) **Building Elevations.** Building elevations will show grading, openings, and principal exterior materials. Exterior elevations will be drawn to scale showing all windows, doors, louvers, canopies, platforms, gutters, downspouts, visible structural frame, control and expansion joints, and panels. Differences in materials will be noted and window and door numbers will be shown.

(g) **Building Sections.** Cross sections of building sections will be provided to show all the uniqueness of the facility in terms of material, finishes, ceiling heights, and construction techniques. The number of building sections will depend on the complexity of the facility. In general, the sections show the general condition plus any unique areas within the facility.

(h) **Wall Sections.** Wall sections will be provided for major components and building systems. Wall sections will also show materials, thicknesses, methods of attachments, and relations of all architectural elements to supporting structures. Wall sections will be provided wherever a new system or construction method is introduced.

6-7. INTERMEDIATE DESIGN SUBMITTAL REQUIREMENTS

a. The designer will update the concept design drawings in accordance with agreed upon review comments.

b. The concept design analyses will be expanded to include any additional information necessary to describe new design information, materials, or techniques which were added since the last design submittal.

c. The CEGS specifications will be marked up based on concept decisions. Any new specifications needed or added since the concept submittal will be added and marked up accordingly.

d. The following design information or new sheets will be added to the concept architectural drawings:

(1) Architectural Floor Plan. This plan will be updated to include door and window numbers, door swings, completed space names, space numbers, section cuts, etc., and will reference all section cut lines on plans to the appropriate detail and any appropriate construction notes. Enlarged plan callouts will be added.

(2) Reflected Ceiling. A reflected ceiling plan will be added showing all the ceiling materials/systems to be used throughout the entire building. The reflected ceiling plans will be at the same scale as the floor plans. The plan will show location of all elements to be placed on the ceiling including, but not be limited to, HVAC diffusers, lights, speakers, and fire protection detectors.

(3) Roof Plan. A roof plan showing roof slopes, drainage, scuppers, roof-mounted equipment, skylights, and traffic surfaces walkways will be developed and added to the concept drawings.

(4) Building Sections. Additional typical cross sections through the entire building showing major building components, building systems, and construction materials.

(5) Wall Sections. Typical wall sections (interior and exterior) will be shown in sufficient number and size to convey adequately the intended construction. Wall sections will show additional dimensions, materials, construction techniques, and unique connections. Major connectors and construction methods will be shown on enlarged details.

(6) Schedules. Tabular schedules of interior finishes and colors, doors, windows, etc., will be developed. Schedules may be placed on the same sheet as the floor plan when the scale and size of the building permits. All blanks on schedules will be filled in. A dash will be used when an entry is not applicable. Ditto marks will not be used on a schedule. Abbreviations listed in MIL-STD-12D will be used as required in identifying materials and finishes. The abbreviations and their definitions will be identified as a note or on a general notes sheet.

(a) Finish Schedule. A finish schedule will be provided for each building. Color selection of exterior and interior finishes, if selected, will be provided. These selections will be incorporated into the finish schedule, or on a separate schedule on the same drawing. The schedule, or its notes, will include exterior colors. Color selections will be coordinated for

each room or space and each building. Colors and corresponding numbers from FED-STD-595B will normally be used to identify color selections of paints and coatings specified in the guide specifications, Section: Painting, General.

(b) Door Schedules. Every door will be assigned a separate number. This number will be circled and clearly indicated on the drawings. The numbering of doors should be as nearly consecutive as possible, beginning with the principal entrance and progressing clockwise around and through the plan. Hardware (HW), if selected, will be indicated on the door schedule by set numbers (HW-1, etc.). The designer will have the option to expand the door number symbol on the plans to include both the door and hardware set numbers. The description of each hardware set number used will be specified. Door schedules will show louver and glazing sizes and types required. Louvers, as differentiated from stamped open lattice grilles, will be used. Fire rating, when applicable, will be indicated on the schedule for the appropriate door. The door schedule will start cross referencing to head, jam, and sill details which are provided for each door on the detail sheets.

(c) Window Schedules. Window schedules may, where space on the sheet allows, be placed on the same sheet with the door schedule, or may be placed on a separate sheet. The method of compliance with energy conservation requirements as contained chapter 11 of the AEI must be indicated.

(d) Equipment Schedules. Where food preparation and serving equipment are required, a schedule defining the preliminary equipment selection will be included. This may be provided on a "blow-up" plan sheet of the area where food service equipment is to be installed or on a separate sheet immediately following the kitchen food preparation service area and its details. The schedule format for food service equipment should comply with commercial standards or accepted methods of depicting this type of equipment. Each piece of equipment will be assigned an individual number and tracked according to that number. All the salient features of the equipment will be included on this sheet. It is important to show all power requirements.

6-8. FINAL DESIGN SUBMITTAL REQUIREMENTS. The A-E will update the previous submittal in accordance with approved review comments. This submittal package will be ready for advertisement once approved by the Government. All internal quality control checks should have been completed to ensure complete, error free construction.

a. Final Drawings

(1) Required Drawings. Final drawings will show all pertinent plans, elevations, sections, details, schedules, and notes to present a complete and accurate description of the construction required. Door, window, and space numbers will be properly shown. Location of wall sections and cross sections will be shown on plans and elevations. All elements to be constructed will be properly annotated and located with proper dimensions.

(2) Coordination of Drawings. The designer will ensure the architectural drawings have been properly coordinated with structural, mechanical, electrical, and site drawings, as well as with specifications.

(3) **Accuracy of Drawings.** Dimensions, schedules, sections, and details will be completely reviewed and checked to ensure proper coordination. The architect will assure that the drawing index is complete and coordinated with the drawings. All errors and discrepancies found will be corrected.

b. Specifications. Specifications will be prepared using the latest guide specifications. Notes to specification writers will be thoroughly reviewed before marking up the specifications. The specification writer, if different from the designer, will become familiar with the drawings and will coordinate his work with the person(s) preparing the architectural drawings to avoid discrepancies.

c. Hardware Consultant. On large complex facilities, the technical support of a certified hardware consultant is recommended to assist in the selecting and specifying the proper hardware sets. The designer will coordinate with the user/installation to ensure the proper master keying system, as well as storage and tagging of all keys.

6-9. TRADE NAMES. The use of trade names and other proprietary indications will be avoided. This includes tailoring of a performance specification to a given brand or trade name. If design requirements indicate an unavoidable inclusion of a "Sole Source" product (i.e., no approved equal), the designer must obtain permission from USAEDH prior to use as required by chapter 3, Project Specifications, of this manual.

6-10. TECHNICAL REQUIREMENTS

a. Sitework

(1) Proper grading and surface drainage will be provided around buildings.

(2) Access to entrances.

(a) Accessible routes will be provided according to UFAS and ADAAG.

(b) Steps in walks between the street and a building will be avoided when possible. A gradient which meets the accessibility slope requirement will be used.

(c) All stoops, steps, or similarly required access to entrances that will normally be built by a building contractor (as differentiated from sidewalks, driveways, etc., which are normally constructed by a paving subcontractor), will be shown on the architectural drawings, and properly coordinated with civil site drawings.

(3) Elevations and Grades

(a) Elevations (in terms of meters (feet) above sea level) of floors, plates, etc., will not be indicated on architectural plans because the location of buildings may be changed after completion and submission of such plans by the designer. These elevations should be shown on the site plan which is described in chapter 5 of this manual. Vertical dimensions of elevations and sections should be from the datum elevation of the building (usually the finish first floor level).

(b) For concrete floor slabs-on-fill, the finished floor will be a minimum of 150 mm (6 inches) above the finish grade.

(4) Paved outdoor areas such as entrances, patios, and roof terraces should be in light earth colors which are subject to less heat build-up and which give less glare than pavements of white or black. Precast colored concrete pavers are well suited for this purpose.

b. Masonry

(1) Interior Masonry Walls and Partitions. Concrete masonry units in interior masonry walls and partitions will not be less than 150 mm (6 inches) in nominal thickness. Coordination is required for embedded items to assure that the items are concealed.

(2) Coursing. Coursing will be coordinated with door and window heights to eliminate the need for cutting a block.

(3) Pipe Chase Walls. The designer will provide and coordinate wall reinforcement designs when the wall is required to support fixtures such as lavatories, urinals, and other fixtures and equipment. Lavatories and urinals will not be hung on masonry walls less than 200 mm (8 inches) thick unless the wall is braced to an adjacent pipe chase wall with "Z" type anchors, in which case 150 mm (6 inches) block may be used. The wall surface opposite fixtures will be free of plates (through bolts, washers, etc.) whenever this space is to be in a finished area such as an office or a bedroom. Anchorage details will be provided on the plan.

c. Miscellaneous Metals

(1) Access panels required to service mechanical items (normally finished and installed by trades other than mechanical and electrical) will be shown and sized on the architectural drawings. Access panels will be specified when required.

(2) Metal cover plates over expansion joints in concrete floors will be designed and constructed so that the top surface of the cover plate will be flush with adjoining finish floor surfaces.

(3) Ferrous metals exposed to corrosive environments will be appropriately protected. Stair safety nosing will be nonferrous.

d. Woods and Plastics

(1) Wood usage overseas should be approached with caution since quality control and availability vary greatly according to the region.

(2) Extreme climatic conditions may adversely affect wood products, including laminated materials, during shipment, storage, and while in use at the project site. Materials should be selected and specified with care to assure that deterioration does not occur. Particular attention must be paid to the characteristics of laminating glues and to the moisture

content of the wood products. The use of wood in exterior exposed conditions is not advisable if another material can be used.

e. Thermal and Moisture Protection

(1) Insulation. Unless directed by criteria, "U" values will be provided as indicated in the AEI. General standards require insulation thickness as determined by the established "U" value for total roof or wall thickness and the typical material used. Unless otherwise directed, "U" values will be provided as required to meet the applicable energy conservation criteria. The thickness of roof or wall insulation will not be dimensioned or indicated on the drawings. Details will allow for possible differences in insulation thickness.

(2) Roofing

(a) Roof slopes will conform with criteria stated in the CEGS. Where practical, the roof slope will be designed in the structural frame rather than the roof decking or insulation. Structural deflection will be designed to assure that positive drainage is maintained to eliminate ponding. Flat valleys between drains are unacceptable.

(b) Exceptions to the criteria for roof slopes will be permissible only in unusual local project conditions. Roof slope exceptions must have prior approval of CEHND-ED-CS-A (Architectural).

(3) Sheet Metal Work

(a) Atmospheric conditions will be considered in the selection of exposed sheet metal. Sheet aluminum will not be specified where welding or soldering problems exist in preparing weatherproof joints. In instances where specifications for various items require the use of sheet metal, the same basic metal material throughout a particular building will be used.

(b) Special flashing details will be developed and shown on the drawings. Conditions will be covered with particular attention given to joints in sheet metal. For clarity an isometric view can be provided.

(c) In the design of roofs and gravel stops, wood nailers will be bolted to the edge face of a concrete roof or tie beam. This will ensure that the exposed bolts and nuts are covered by the gravel stop fascia. When angles are a part of the fascia system, waterproofing and joining details will be shown on the drawings.

(d) Where downspouts occur at walks or platforms, they will pass through or under into subsurface storm drains or toward open ground beyond. Down-spouts draining onto open ground will use splash blocks.

(4) Caulking and Sealing. The CEGS and TM 5-805-6 will be followed. Applicable details from TM 5-805-6 will be placed on the drawings.

f. Doors and Windows

(1) Doors

(a) All doors will be adequately sized to accommodate the installation and removal of furniture and/or equipment.

(b) Personnel doors will be 2100 mm (7 feet 0 inch) or 2200 mm (7 feet 2 inches) high in new nonresidential designs. When sketches, definitives or standard drawings are furnished to the designer with doors only 2000 mm (6 feet 8 inches) high, USAEDH should be consulted as to whether door heights should be changed to 2100 mm (7 feet 0 inch). Personnel doors will not be less than 900 mm (3 feet 0 inch) in width, except for toilet rooms, closets, and special purpose doors (e.g., confessional or emergency exits for projection rooms).

(c) A pair of service doors to mechanical equipment rooms will normally be provided to the exterior. Doors from the power rooms, generator rooms, etc., will always be to the outside. Fully louvered doors will have an intermediate rail. Doors will be sized and located to serve both the installation/removal and maintenance of equipment.

(d) Specialty doors such as rolling steel or horizontal doors will be adequately designed to safely resist and operate during the maximum wind velocities and wind pressures. Motorized doors will be provided per the guide specifications.

(e) Fire doors will be indicated on the door schedule. The basis of design, when not specifically defined by criteria, will be the NFPA 80, 80A, and 101.

(f) Exterior pairs of doors will be provided with an astragal or weather-stripping. All exterior doors will have thresholds shown on the plans and details. Thresholds for steel doors will conform to guide specification requirements, and threshold requirements will be included as part of the door schedule.

(2) Hardware. Hardware will be specified and selected IAW with American National Standards Institute (ANSI)/Builders Hardware Manufacturers Association (BHMA).

(a) Door closers should be surface-mounted on the doors. Door pivots recessed below the door threshold will not be used. When selecting hardware sets, the designer will limit the use of closers to reasonable or code-required locations. Parallel arm closers are required when the hinged jamb is less than 180 mm (7 inches) from the adjacent perpendicular wall. The A-E will limit the use of door coordinators at pairs of doors only in those locations where removable mullions cannot be used and where both leaves must be active.

(b) Hardware set designators should be listed in the door schedule according to location on the floor plan. The specifications on builder's hardware will provide the necessary set designation numbers and description of each hardware group.

(3) Windows

- buildings.
- (a) Operable windows may be provided in seasonally air-conditioned buildings.
 - (b) Insect screening devices will be provided when required.
 - (c) Access for cleaning glass and minimize horizontal or canted glass will be provided.

g. Finishes

- (1) The use of acoustical plaster is discouraged. In electronic and communication facilities in which avoidance of dust is a major concern, acoustical treatment will be limited to acoustical tile with nondusting characteristics.
- (2) Paint colors are generally chosen using FED-STD-595B. Use of a paint manufacturer's standard color may be used where FED-STD-595B colors are not adequate. In those areas, the manufacturer's colors are strictly to show colors and not to "sole-source" paint. Colors and patterns of factory finished products will be selected from the manufacturer's standard colors. Preferably, references to three different manufacturers, whose products are known to meet the product specifications, should be given for each color selection. The successful vendor will submit color chips of standard colors and textures for selection.

h. Specialties

- (1) Toilet Partitions. For privacy, all toilet enclosures and all showers must be designed so that vision from outside the stall is not possible.
- (2) Louvers and Vents. Roof ventilators, duct work, louvers, and other roof appurtenances will be indicated on the elevation and roof plans.
- (3) Roof-mounted Equipment. The mounting of any equipment on the roof should be kept to a minimum.
- (4) Signage and Graphics. Signage will be in English unless otherwise indicated. All signage will comply with UFAS, ADAAG, and EP 310-1-6.

i. Metal Buildings

- (1) Exposed insulation will be detailed on the drawings and specified to be rigid or semi-rigid board insulation.
- (2) In humid coastal regions, nightly condensation on the cool surfaces of metal buildings results in run-off, which if not controlled could stain the siding and lower wall finish, and promote the growth of mildew on north exposures.

j. Plumbing

(1) Floor Drains and Slopes. Hose bibbs and shower heads will be shown on architectural and mechanical drawings and will be closely coordinated with both disciplines. All floors in areas requiring drains will be sloped toward the drains.

(2) Alcoves (such as for drinking fountains) will be sized to facilitate installation and maintenance of the units.

6-11. USE OF DOCUMENTS. Publications such as the CEGS, Federal Specifications, and American Society for Testing and Material (ASTM) standards referenced in guide specifications often require choices by the designer as to the exact material, finish, size, etc. In addition, specific notes in some guide specifications actually serve as designer instructions. Designers and specification writers must be thoroughly knowledgeable of the contract and guide specification and their application throughout all phases of design.

6-12. HUMAN ENGINEERING. The designer will consider the use of colors, acoustical treatment, configuration of spaces (as related to equipment operability and maintainability), man/machine relations, and other pertinent features affecting human engineering. MIL-STD-1472D will be used as basic criteria when applicable. (Also refer to chapter 4, Systems Safety Engineering and chapter 15, Systems Engineering.)